

REMARKS

Claims 1-12 are pending. Claim 1 is amended. Reconsideration of the claims in light of the following remarks is requested.

With respect to all amendments and cancelled claims, Applicant has not dedicated or abandoned any unclaimed subject matter. Applicant reserves the right to pursue prosecution of any presently excluded claim embodiments in future continuation and/or divisional applications.

Claim Amendment

Claim 1 is amended for technical clarity.

Claim Rejections - 35 U.S.C. §103

Claim 1-12 stand rejected under 35 U.S.C. §103 as being unpatentable over Steigerwald et al. (US 6,479,404) ("*Steigerwald*") in view of Hedge et al. ("*Hedge*"). Applicant respectfully traverses.

When rejecting claims under 35 U.S.C. §103, the Examiner bears the burden of establishing a *prima facie* case of obviousness. See, e.g., *In re Bell* 26 USPQ2d 1529 (Fed. Cir. 1993); M.P.E.P. Section 2142. To establish a *prima facie* case, the prior art reference(s) must teach or suggest each and every limitation of the rejected claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine their teachings. *In re Vaack*, 20 USPQ2d 1438 (Fed. Cir. 1991); M.P.E.P. §2142.

A. The references do not teach or reasonably suggest “a first layer formed of a metal oxide material ... having the formula of M_xO_y and a second layer formed atop the first layer wherein said second layer is formed of a metal silicate material”

Claims 2-11 depends from claim 1. Claims 1 and 12 recite “a first layer formed of a metal oxide material ... having the formula of M_xO_y and a second layer formed atop the first layer wherein said second layer is formed of a metal silicate material”

In contrast, *Steigerwald* discloses “a single crystal semiconductor substrate” and a “gate dielectric ... formed on the substrate” and where the “gate dielectric is either a metal oxide, a metal silicate or both.” Col. 1, lines 58-63.

Applicant respectfully submits that *Steigerwald* does not teach two separate layers formed atop each other as claimed in the instant application, *Steigerwald* teaches only one dielectric layer which is either metal oxide, metal silicate, or a combination of both materials. This is further shown in reference to the Figures of *Steigerwald*. Specifically, Figures 2, 3 and 4 show silicon substrate **200** with channel region **210** and filed oxide regions **215** formed therein (thus, 210 is not a dielectric layer). Column 5, lines 8 to 11. *Steigerwald* then teaches that “For illustrative purposes, the surface of the substrate is prepared by forming a layer of oxide **225** (FIG. 3) on the surface thereof.” Column 5, lines 34 to 36. Finally, *Steigerwald* states “dielectric layer **230** is either a metal oxide layer or a metal silicate layer. The dielectric layer is formed on the prepared surface of the silicon substrate.” Column 5, lines 38 to 40.

Thus, *Steigerwald* does not teach a first layer of metal oxide with a second layer formed atop the first, said second layer being formed of metal silicate as recited in Claims 1 – 12. At

best *Steigerwald* teaches layer of oxide 225 and a dielectric layer 230 formed atop, the dielectric layer being formed of either a metal oxide layer or a metal silicate layer.

Also in contrast, *Hegde* discloses “[a]structure includes a semiconductive region, a first oxide layer, a second oxide layer, and a conductive layer.” Col. 1, lines 60-62. “The first oxide layer includes at least a portion that is amorphous or includes a first element, a second element, and a third element.” Col. 1, lines 65-67. One example of the first layer is $Zr_xSi_yO_z$. See col. 2, lines 60. Because *Hedges* discloses a first layer with three elements, not two elements, it does not teach “a first layer formed of a metal oxide material... having the formula of M_xO_y ” as claims 1-12 recite.

Therefore, neither *Steigerwald* nor *Hegde* teaches or reasonably suggests “a first layer formed of a metal oxide material... having the formula of M_xO_y and a second layer formed atop the first layer wherein said second layer is formed of a metal silicate material ” as required by the claimed invention.

Additionally, neither *Steigerwald* nor *Hegde* teach or reasonably suggest a multilayer dielectric film where the second layer has a dielectric constant lower than the dielectric constant of said first layer, as required by Applicant’s claims.

B. It is improper to combine *Steigerwald* with *Hedge* because *Hegde* teaches away from the instant invention.

It is improper to combine references where the references teach away from their combination. In *re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). A reference may be said to teach away when a person of ordinary skill, upon reading the reference,

would be led in a direction divergent from the path that was taken by the applicant. *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994).

Claims 2-11 depends from claim 1. Claims 1 and 12 recite a “second layer is formed of a metal silicate material.”

In contrast *Hedge* discloses “[a] second oxide layer comprises a silicon-oxygen compound, such as silicon dioxide, having no more than approximately one atomic percent metallic element content and, more typically, having a metallic element content of less than approximately 0.09 atomic percent.” Col. 3, lines 19-22 (emphasis added).

Therefore, a skilled artisan, upon reading *Hedge*, would be led to make a second layer with less than one percent of metallic element, and would not make a “second layer formed of a metal silicate material” as required by the instant invention. As such, *Hedge* actually teaches way from the instant invention and it is improper to combine *Hedges* with *Steigerwald*.

Because the references do not teach each and every elements of the claimed invention and it is improper to combine the references, the Examiner fails to make a *prima facie* case of obviousness. Applicant respectfully requests the rejection on this basis be withdrawn.

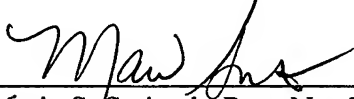
CONCLUSION

Applicants respectfully submit that all pending Claims of the captioned Application satisfy all requirements for patentability and are in condition for allowance. An early indication of the same is therefore respectfully requested.

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If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below. Commissioner is authorized to charge any additional fees to Deposit Account No. 50-2319 (Order No. A-70028-2/MSS/MRC (463035-964)).

Respectfully submitted,



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